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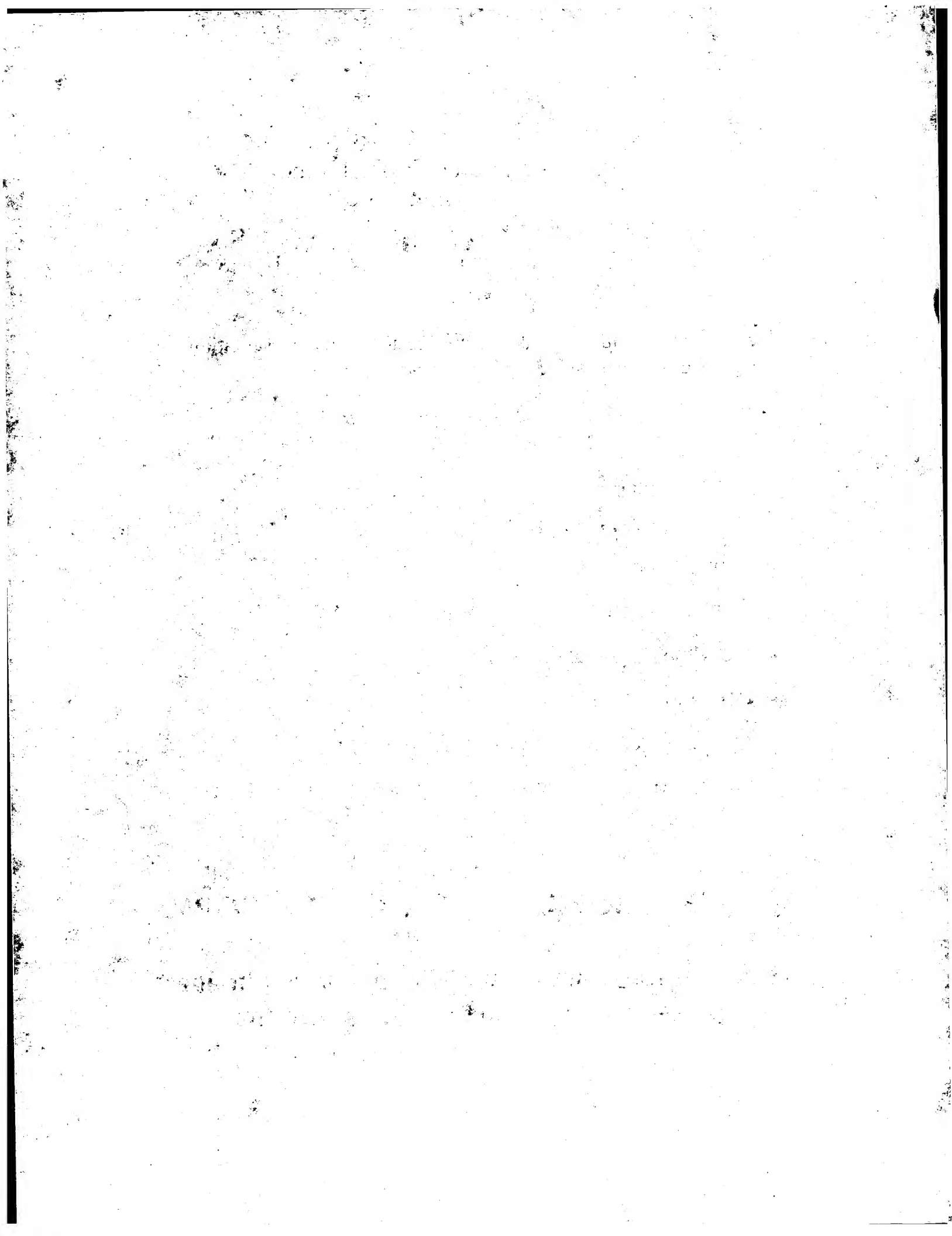
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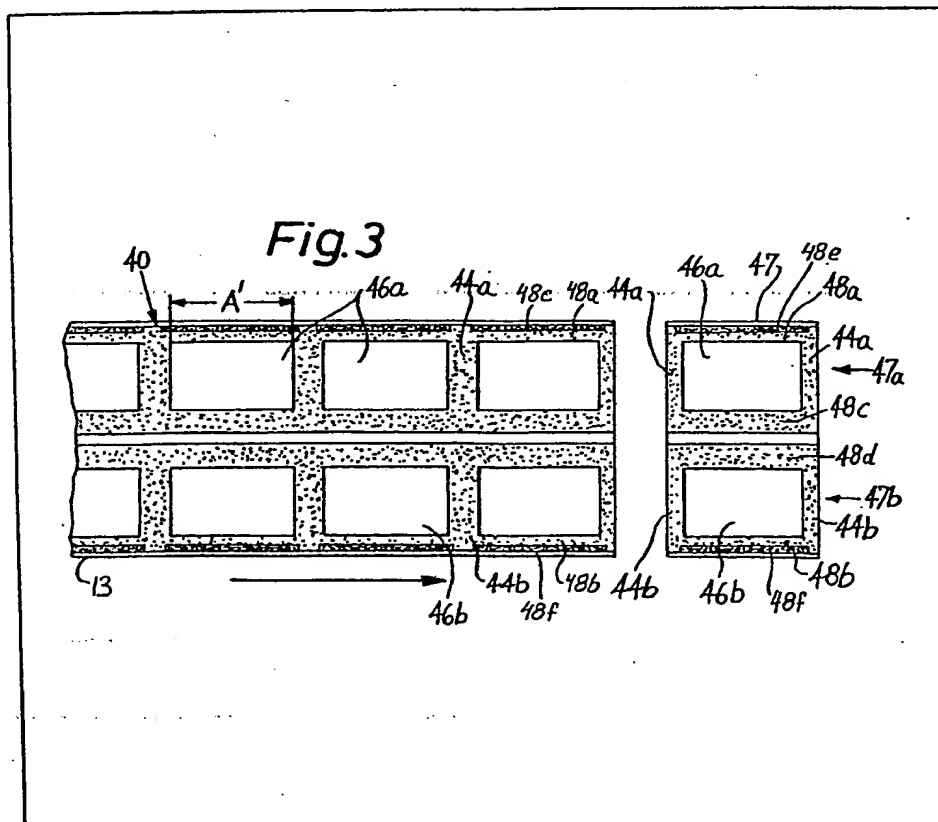
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## (54) Applying adhesive paste to connector strip for filter cigarettes

(57) Adhesive paste is applied to a travelling connector strip (13), which is then divided into sections (47) each of which is wound around a filter/cigarette (51) [Fig. 4] for connecting the same. The application involves the deposition in the region of a side edge, at which the connector strip sections are adhesively joined to the cigarette (Z), of a strip of paste (48e, f) which extends in the feed direction of the connector strip and which is thicker than the layer of paste

in other regions. The thicker strip of paste (48e, f) is deposited at a spacing from the side edge of the connector strip and is interrupted in regions (44a, b) in which the connector strip is divided into sections. In these regions a thinner layer of paste is deposited. Zones (46a, b) are paste-free. The paste is applied using a roller (39) [Fig. 2] of which the surface is recessed to different depths. The recesses extend in the direction of rotation and a deeper recess (41e, f) is provided in the appropriate position on said roller in order to deposit the thicker strip of gum.



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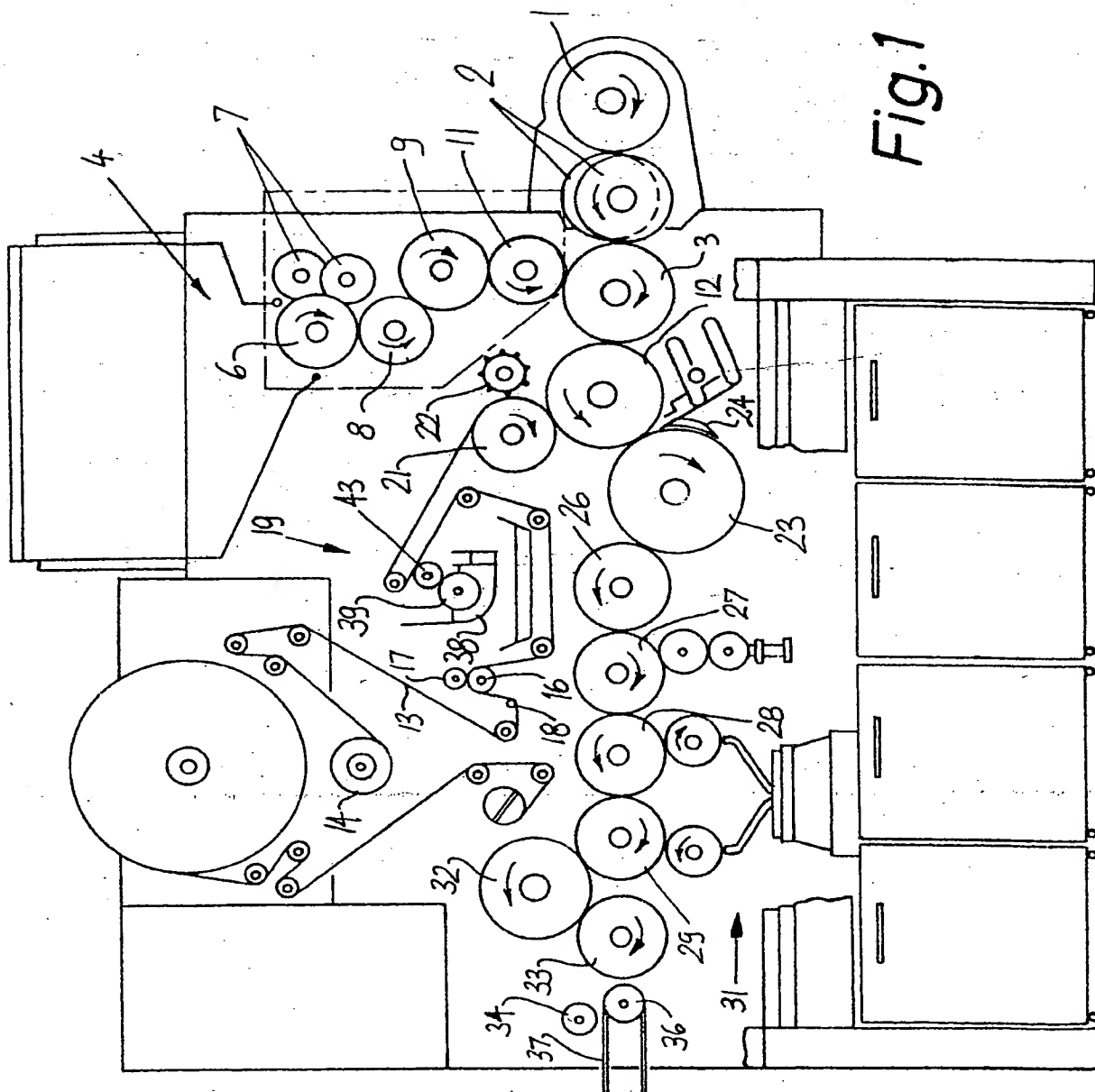


Fig. 1

Fig. 3

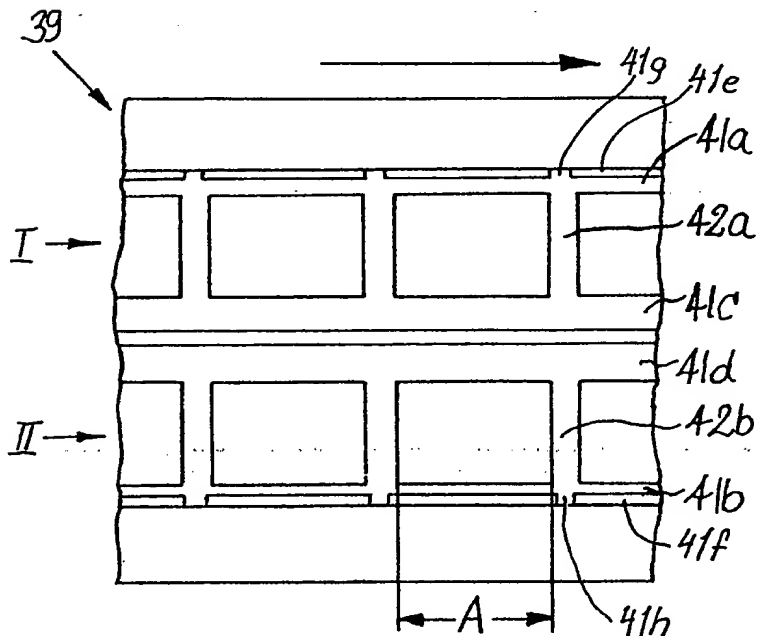
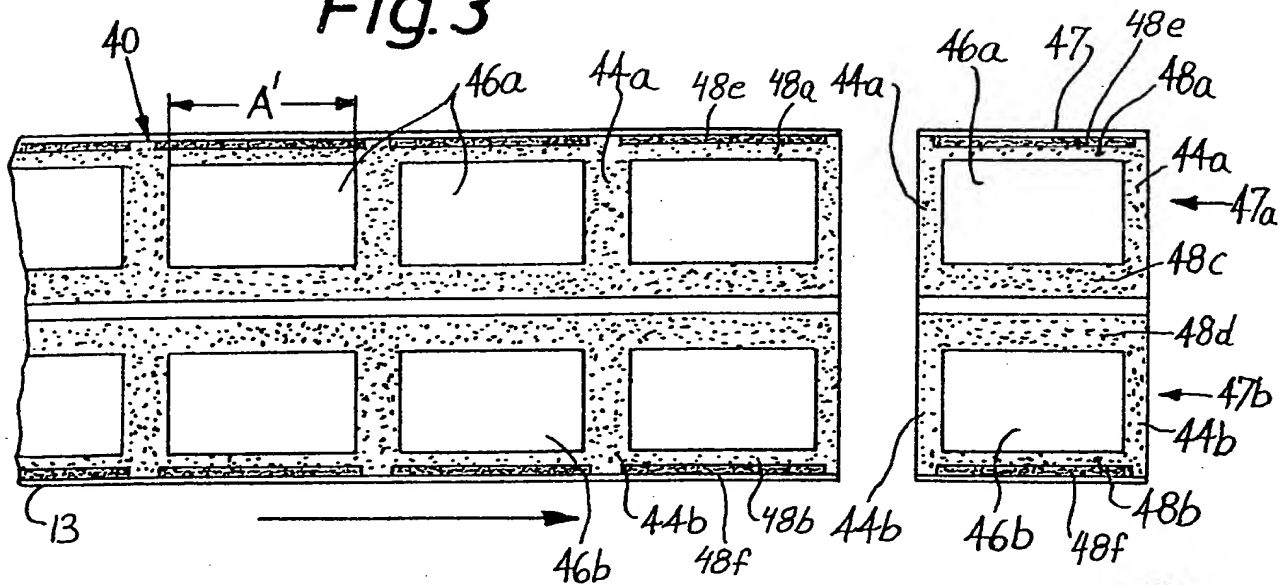


Fig. 2

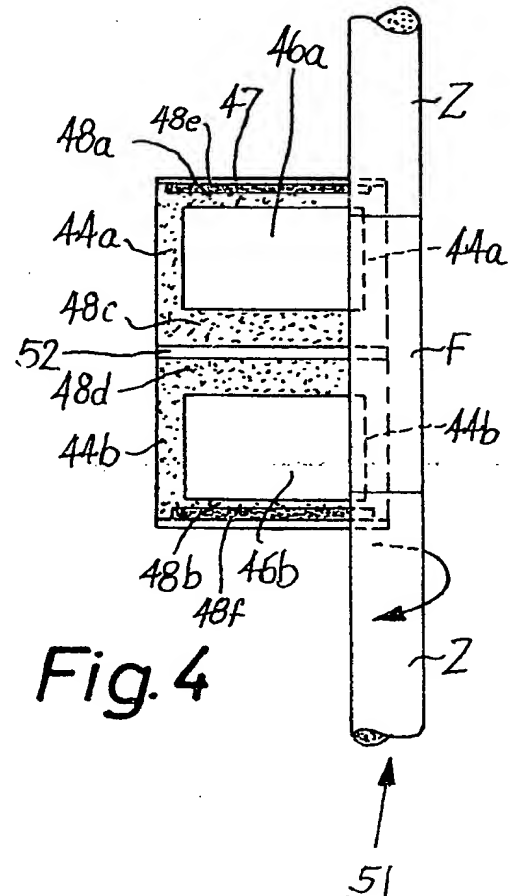


Fig. 4

# SPECIFICATION

A method of and apparatus for applying adhesive paste to a travelling connector strip for smokable articles

5 The invention relates to a method of depositing adhesive paste on a travelling connector strip for smokable articles which is divided into connector strip sections after the deposition of paste, each of which sections is wound around a smoker's article and a mouthpiece associated therewith, wherein  
10 in the region of the side edge at which the connector strip sections are adhesively joined to the smokable articles a strip of paste is deposited which extends in the feed direction of the connector strip and which is thicker than the layer of paste in other regions.

Moreover, the invention relates to apparatus for depositing paste on a travelling connector strip for smokable articles with a feeder means for withdrawing the connector strip from a store, with  
20 a store of paste and a rotary paste feeder roller the surface of which comprises depressions of different depth which extend in the direction of rotation, and with a cutting device arranged therebehind for cutting connector strip sections off the connector strip, each of which sections is wrapped around a smokable article and a mouthpiece associated therewith on a rolling device arranged therebeyond.

30 A problem zone in the connection between a smokable article and a mouthpiece, e.g. a cigarette and a filter plug in the production of filter cigarettes, is the adhesive joint between the wrapping material of the tobacco rod and the connector sheet. The connector sheet and the wrapping material of the tobacco rod overlap only for a few millimeters and perfect adhesion must be ensured because otherwise so-called air pockets are produced through which, during  
40 smoking, by-pass air is sucked in in an uncontrolled and therefore undesirable manner. A very good adhesion can be obtained by the deposition of relatively thick gum patterns on the connector strips. An attendant disadvantage is  
45 that the mouthpiece attachment machine is soiled by thickly deposited gum, whereby in particular the functions of the cutting device and the rolling device are disadvantageously affected. Machine disturbances caused by gum contaminations

50 necessitate thorough cleaning of the machine. The consequent down-time results in a corresponding loss of production. In order to reduce the soiling by gum of the machine, it has already been proposed to provide only one side edge of the connector  
55 strip with a thicker layer of gum which side edge later on forms the overlap with the wrapping material of the tobacco rod. However, this method still did not completely avoid the thicker layer of gum being squeezed out under the connector  
60 sheet during the rolling process, i.e. the problem of

65 method of depositing gum in such a manner that on the one hand good conditions are produced for a perfect adhesive joint between the wrapping material of the tobacco rods and the connector sheets, and, on the other hand, the contamination of a mouthpiece attachment machine by gum  
70 squeezed out during the rolling process is reduced.

This problem is solved according to the invention in that the thicker strip of gum is deposited at a spacing from the side edge of the connector strip, and that the deposition of the  
75 thicker strip of gum is interrupted in regions in which the connector strip is divided into the connector strip sections, wherein in these regions gum of thinner layer thickness is deposited. The thicker strip of gum in the relevant region of the connector sheets ensures a satisfactory adhesive joint with the wrapping material of the tobacco rods. Since the thicker strip of gum has a spacing from the side edge of the connector strip sections,  
80 gum is prevented from being squeezed out under the connector sheet in an axial direction of the smokable article during the roller process. According to the invention the thicker strip of gum is interrupted in the regions in which the connector strip is being cut, so that additional soiling of the cutting device does not occur. Also at the end of the rolling process, when the ends of the connector strip section are adhesively attached in an overlapping manner, no gum issues at the overlap, since in the region of the edge of the connector strip section merely a thin layer of gum is deposited; according to the invention the thicker strip of gum terminates short of this edge.

In view of the very great number of smokable  
100 articles produced endeavours are made for reasons of cost to optimise the use of material. Considered over a year, however, the deposition of a thicker strip of gum leads to a considerably increased consumption of gum. According to a further development of the invention an increased consumption of gum may be avoided, or gum may even be saved, when gum patterns of strips of gum extending in the feed direction and across the feed direction are deposited in such a manner that  
110 in the region of their four side edges the connector strip sections comprise a respective strip of gum, wherein the thicker strips of gum are deposited at a side edge of a strip of gum extending in the feed direction.

115 The apparatus referred to above which is suitable in particular for performing the method described heretofore is characterised in that a deeper depression in the direction of rotation of the gum feeder roller is limited by ledges the surface of which is located at least approximately at the level of the shallower depressions. In a further development of the invention which reduces the consumption of gum, the surface of the gum feeder roller comprises two annular  
120 shallower depressions which extend at an axial

associated with a side edge of an annular shallower depression, and this side edge faces away from the other annular depression.

According to a further embodiment the ledges which limit a deeper depression in the direction of rotation of the gum feeder roller are each arranged in the region of shallower depressions which extend across the direction of rotation.

Furthermore it is proposed that the gum feeder roller comprises two rows of depressions of mirror-symmetrical gum patterns, wherein the deeper depressions which are interrupted by ledges are arranged in the region of oppositely disposed side edges of the gum patterns.

The invention is explained in detail with reference to the drawing which illustrates a constructional example. There are shown in:

Fig. 1 a diagrammatic general view of a filter attachment machine of the Type MAX S of the Applicants,

Fig. 2 a section of the developed peripheral surface of a gum feeder roller of the filter attachment machine of Fig. 1, approximately natural size,

Fig. 3 a gummed connector strip as well as a connector strip section approximately natural size cut off the same,

Fig. 4 a connector strip section attached to a cigarette-filter plug-cigarette group, approximately natural size.

The known filter attachment machine shown in Fig. 1 comprises an inlet drum 1 which transfers plane cigarettes of unit length produced on a rod machine to two aligning drums 2 which align the cigarettes supplied in two staggered rows by the drum 1 and deliver them in pairs to an assembly drum 3. Each pair comprises two coaxial cigarettes spaced apart by a gap having a width which at least equals the length of a filter rod section or filter plug of double unit length. Mouthpieces in the form of filter rods travel from a magazine 4 to a cutting drum 6, are cut by two circular cutters 7 into filter plugs of double unit length, are staggered on a staggering drum 8, are aligned by a shuffling drum 9 to form a row of plugs located one behind the other, and are deposited by an accelerating drum 11 into the gaps of the successive pairs of cigarettes on the assembly drum 3. The cigarettes of each group are then moved towards each other so that their inner ends contact the respective ends of the coaxial filter plug. Finally they are received by a transfer drum 12.

A connector strip 13 is drawn off a store in the form of a paper reel 14 by feeder means in the form of a draft roller 16 and a presser roller 17. The connector strip 13 is guided around the relatively sharp edge of a curling device 18 (the purpose of which is to eliminate and/or equalize internal stresses in the material of the connector strip 13), is provided with a paste pattern according to Fig. 3 by means of a paster 19 and is cut by a cutter drum 22 on a roller 21 which is driven at an increased peripheral speed and on

The cut connector strip sections are attached to the cigarette-filter-cigarette groups on the transfer drum 12 (see Fig. 4), and are rolled around the cigarette-filter-cigarette groups by means of a roller hand 24 on a rolling device in the form of a rolling drum 23. The finished groups of double filter cigarettes are supplied by means of a drying drum 26 to a cutting drum 27 which produces single filter cigarettes by cutting centrally through the filter plugs, faulty filter cigarettes being ejected at the same time. A turning device 31 which cooperates with a transfer drum 28 and a collecting drum 29 turns one row of filter cigarettes and transfers them at the same time into the un-turned row of filter cigarettes travelling through by way of the transfer drum 28 and the collector drum 29.

By way of a testing drum 32 the filter cigarettes travel to an ejector drum 33 on which head testing of the filter cigarettes is effected prior to the ejection process. A delivery drum 36 cooperating with a deceleration drum 34 deposits the filter cigarettes on a discharge belt 37.

The paster 19 comprises a storage container 38 for a supply of adhesive paste from which the peripheral surface of a paste feeder roller 39 removes a film of paste. The peripheral surface of the paste feeder roller 39 comprises two rows I and II of mirror-symmetrical recesses which are formed by ground-in longitudinal grooves 41a ... 41d and transverse grooves 42a, 42b (Fig. 2). In the region of the outer side edges of the longitudinal strips 41a and 41b are ground deeper longitudinal recesses 41e and 41f, respectively, interrupted in the region of the transverse strips 42a and 42b, respectively, by ledges 41g and 41h, respectively, which have been left standing during grinding-in of the longitudinal strips 41e and 41f. The unrecessed smooth peripheral surface of the paste feeder roller 39 rolls on a smooth peripheral surface of a paste transfer roller 43 and transfers onto it the paste located in the longitudinal grooves 41a ... 41f and in the transverse grooves 42a, 42b in a pattern corresponding to the pattern of said grooves. A thicker layer of paste is transferred from the longitudinal recesses 41e and 41f, than from the shallower regions of the longitudinal grooves 41a ... 41d and the transverse grooves 42a and 42b.

As compared to the rollers 39 and 43, the draft roller 16 is driven at a different peripheral speed, in the illustrated example at a higher peripheral speed. This has the consequence that relative movement or slip takes place between the connector strip 13 and the peripheral surface of the paste transfer roller 43, i.e. the connector strip 13 wipes over the peripheral surface of the rotating paste transfer roller 43. For this reason the paste pattern on the transfer roller 43 is stretched during transfer to the connector strip 13 so that the transferred paste pattern 40 on the connector strip 13 comprises paste strips 44a, 44b which are broader than the transverse

feeder roller 39, and paste-free zones 46a, 46b are created, which have a dimension A' which is longer than the spacing A between the grooves 42a, 42b on the paste feeder roller 39.

- 5 By cutting centrally through the transverse strips 44a, 44b of the gum pattern, connector strip sections 47 are cut off the connector strip 13. Each connector strip section 47 consists of two symmetrical sections 47a, 47b, each of which  
10 comprises paste-free zones 46a, and 46b, respectively, which are surrounded on all sides by pasted strips 44a, 48a, 48c and 44b, 48b, 48d, respectively. The strips 48a and 48b are slightly set in relative to the side edges of the connector  
15 strip sections 47 and each comprise a narrow section 48e, 48f of greater thickness ending just short of the cut edges of the connector strip sections 47.

- As illustrated in Fig. 4, the connector strip  
20 section 47 is attached to a cigarette (Z)-filter plug (F)-cigarette (Z) group 51 by means of the leading paste strips 44a, 44b and thereafter rolled around the group, the trailing gum strips 44a, 44b forming the adhesive seam of the connector strip  
25 section 47 in this case. The wrapped cigarette-filter-cigarette group 51 is then cut through the centre of a gum-free zone 52 between the paste strips 48c and 48d.

- Upon change of the format, that is to say when  
30 connector strip sections 47 of different longitudinal dimension are needed, it is merely necessary to replace the draft roller 16 by one of a different diameter and to replace the paste feeder roller 39 by one having a different ground-in  
35 pattern of recesses. In doing so, the recesses parallel to the axis of rotation of the paste feeder roller and the spacings between them are larger or smaller, in inverse proportion to the speed  
40 difference between the connector strip and the paste feeder and transfer rollers, than the paste strips and their mutual spacings on the connector strips are required to be. These dimensions must  
45 be greater if, as is obviously also possible, the peripheral speed of the paste feeder roller or the gum transfer roller is greater than the feed speed of the connector strip. A corresponding pattern of recesses may be ground into the paste feeder roller, or into the paste transfer roller, or even into both rollers.

## 50 CLAIMS

1. A method of applying adhesive paste to a travelling connector strip which is then divided into sections each of which is wound around a rod-shaped smoker's article and an adjoining  
55 mouthpiece for connecting the same, wherein in the region of a side edge at which the connector strip sections are adhesively joined to the smokable articles a strip of paste is deposited which extends in the feed direction of the

- 60 connector strip and which is thicker than the layer of paste in other regions, the thicker strip of paste being deposited at a spacing from the side edge of the connector strip and being interrupted in regions in which the connector strip is divided into  
65 the sections, a thinner layer of paste being deposited in said regions.

2. A method as claimed in claim 1, wherein paste patterns formed from strips of paste extending in the feed direction and transversely of  
70 the feed direction are deposited in such a manner that the connector strip sections comprise a respective strip of paste in the region of each of their four side edges, and the thicker strips of paste are deposited at a side edge of a strip of  
75 paste extending in the feed direction.

3. Apparatus for applying adhesive paste to a travelling connector strip, comprising feeder means for withdrawing the connector strip from a store, a container for paste and a paste feeder  
80 roller the surface of which comprises recesses of different depth extending in the direction of rotation, and a cutting device arranged therebehind for cutting connector strip sections off the connector strip, said sections being wound in  
85 use on a rolling device around a smokable article and a mouthpiece associated therewith, wherein a deeper recess is limited in the direction of rotation of the feeder roller by ledges the surface of which is located at least approximately at the level of the  
90 shallower recesses.

4. Apparatus as claimed in claim 3, wherein the surface of the paste feeder roller comprises two annular shallower recesses which are spaced apart axially of the roller and are connected by a  
95 plurality of recesses of the same depth which extend transversely of the direction of rotation, and the deeper recesses are associated with a side edge of an annular shallower recess which side edge faces away from the other annular recess.

5. Apparatus as claimed in claim 3 or 4, wherein the ledges limiting a deeper recess in the direction of rotation of the feeder roller are each arranged in the region of a shallower recess  
100 extending across the direction of rotation.

6. Apparatus according to any one of claims 3 to 5, wherein the feeder roller comprises two rows of recesses for producing mirror-symmetrical paste patterns, wherein the deeper recesses which are interrupted by ledges are arranged in the  
110 region of oppositely directed side edges of the paste patterns.

7. A method of applying adhesive paste to a travelling connector strip, substantially as herein described with reference to the accompanying  
115 drawings.

8. Apparatus for applying adhesive paste to a travelling connector strip, substantially as herein described with reference to and as illustrated in the accompanying drawings.